# Complete Summary

## GUIDELINE TITLE

ACR Appropriateness Criteria™ for sinusitis in the pediatric population.

## BIBLIOGRAPHIC SOURCE(S)

McAlister WH, Parker BR, Kushner DC, Babcock DS, Cohen HL, Gelfand MJ, Hernandez RJ, Royal SA, Slovis TL, Smith WL, Strain JD, Strife JL, Kanda MB, Myer E, Decter RM, Moreland MS. Sinusitis in the pediatric population. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):811-18. [44 references]

## COMPLETE SUMMARY CONTENT



## SCOPE

### DISEASE/CONDITION(S)

Sinusitis

### GUIDELINE CATEGORY

Diagnosis

### CLINICAL SPECIALTY

Allergy and Immunology
Family Practice
Otolaryngology
Pediatrics
Pulmonary Medicine
Radiology

### INTENDED USERS

Physicians

### GUIDELINE OBJECTIVE(S)

To evaluate the appropriateness of initial radiologic examinations for sinusitis in the pediatric population

### TARGET POPULATION

Children with sinusitis

### INTERVENTIONS AND PRACTICES CONSIDERED

1. Plain paranasal sinus radiographs
2. Cranial computed tomography including sinuses and orbits with contrast media
3. Coronal computed tomography scan of paranasal sinuses
4. Magnetic resonance multiple views of paranasal sinus with gadolinium
5. Paranasal sinus sonography

### MAJOR OUTCOMES CONSIDERED

Utility of radiologic examinations in differential diagnosis

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The guideline developer performed literature searches of recent peer-reviewed medical journals, primarily using the National Library of Medicine´s MEDLINE database. The developer identified and collected the major applicable articles.

### NUMBER OF SOURCE DOCUMENTS

The total number of source documents identified as the result of the literature search is not known.

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Expert Consensus (Delphi Method)
Weighting According to a Rating Scheme (Scheme Not Given)

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

## METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review with Evidence Tables

## DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

One or two topic leaders within a panel assume the responsibility of developing an evidence table for each clinical condition, based on analysis of the current literature. These tables serve as a basis for developing a narrative specific to each clinical condition.

## METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus (Delphi)

## DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

Since data available from existing scientific studies are usually insufficient for meta-analysis, broad-based consensus techniques are needed to reach agreement in the formulation of the Appropriateness Criteria. Serial surveys are conducted by distributing questionnaires to consolidate expert opinions within each panel. These questionnaires are distributed to the participants along with the evidence table and narrative as developed by the topic leader(s). Questionnaires are completed by the participants in their own professional setting without influence of the other members. Voting is conducted using a scoring system from 1-9, indicating the least to the most appropriate imaging examination or therapeutic procedure. The survey results are collected, tabulated in anonymous fashion, and redistributed after each round. A maximum of three rounds is conducted and opinions are unified to the highest degree possible. Eighty (80) percent agreement is considered a consensus. If consensus cannot be reached by this method, the panel is convened and group consensus techniques are utilized. The strengths and weaknesses of each test or procedure are discussed and consensus reached whenever possible.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

## COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

## METHOD OF GUIDELINE VALIDATION

Internal Peer Review

## DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Criteria developed by the Expert Panels are reviewed by the American College of Radiology (ACR) Committee on Appropriateness Criteria and the Chair of the ACR Board of Chancellors.

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

ACR Appropriateness Criteria™

Clinical Condition: Possible Acute or Chronic Sinusitis

Variant 1: Nasal discharge and fever <10 days' duration.

| Radiologic Exam Procedure | Appropriateness Rating | Comments |
|---|---|---|
| Plain paranasal sinus radiographs | 2 | One to four projections. See literature review (in the original guideline document). |
| Cranial computed tomography including sinuses and orbits with contrast media | 2 | |
| Coronal computed tomography scan of paranasal sinuses | 2 | |
| Magnetic resonance: multiple views of paranasal sinuses with gadolinium | 2 | |
| Paranasal sinus sonography | 1 | A or B mode or real time. |
| Appropriateness Criteria Scale<br><br>1 2 3 4 5 6 7 8 9<br><br>1=Least appropriate 9=Most appropriate | | |

Variant 2: Purulent nasal discharge and fever >10 days' duration.

| Radiologic Exam Procedure | Appropriateness Rating | Comments |
|---|---|---|
| Coronal computed tomography scan of | 8 | |

| | | |
|---|---|---|
| paranasal sinuses | | |
| Plain paranasal sinus radiographs | 3 | One to four projections. |
| Cranial computed tomography including sinuses and orbits with contrast media | 2 | |
| Magnetic resonance: multiple views of paranasal sinuses with gadolinium | 2 | |
| Paranasal sinus sonography | 1 | A or B mode or real time. |
| Appropriateness Criteria Scale<br><br>1 2 3 4 5 6 7 8 9<br><br>1=Least appropriate 9=Most appropriate | | |

Variant 3: Headache, no nasal discharge.

| Radiologic Exam Procedure | Appropriateness Rating | Comments |
|---|---|---|
| Plain paranasal sinus radiographs | 2 | One to four projections. |
| Paranasal sinus sonography | 2 | A or B mode or real time. |
| Cranial computed tomography including sinuses and orbits with contrast media | 2 | |
| Coronal computed tomography scan of paranasal sinuses | 2 | |
| Magnetic resonance: multiple views of paranasal sinuses with gadolinium | 2 | |
| Appropriateness Criteria Scale<br><br>1 2 3 4 5 6 7 8 9<br><br>1=Least appropriate 9=Most appropriate | | |

Variant 4: Recurrent or persistent clinical sinusitis.

| Radiologic Exam Procedure | Appropriateness Rating | Comments |
|---|---|---|
| Coronal computed tomography scan of paranasal sinuses | 8 | |
| Plain paranasal sinus radiographs | 2 | One to four projections. |
| Cranial computed tomography including sinuses and orbits with contrast media | 2 | |
| Magnetic resonance: multiple views of paranasal sinuses with gadolinium | 2 | |
| Paranasal sinus sonography | 1 | A or B mode or real time. |
| Appropriateness Criteria Scale<br><br>1 2 3 4 5 6 7 8 9<br><br>1=Least appropriate 9=Most appropriate | | |

Variant 5: Poorly responding asthma or history of atopia with persistent nasal discharge.

| Radiologic Exam Procedure | Appropriateness Rating | Comments |
|---|---|---|
| Coronal computed tomography scan of paranasal sinuses | 6 | |
| Plain paranasal sinus radiographs | 2 | |
| Cranial computed tomography including sinuses and orbits with contrast media | 2 | |
| Magnetic resonance: multiple views of paranasal sinuses with gadolinium | 2 | |

| | | |
|---|---|---|
| Paranasal sinus sonography | 1 | A or B mode or real time. |
| Appropriateness Criteria Scale<br><br>1 2 3 4 5 6 7 8 9<br><br>1=Least appropriate 9=Most appropriate | | |

Variant 6: Preoperative evaluation for functional endoscopic sinus surgery.

| Radiologic Exam Procedure | Appropriateness Rating | Comments |
|---|---|---|
| Coronal computed tomography scan of paranasal sinuses | 9 | |
| Plain paranasal sinus radiographs | 2 | One to four projections. |
| Cranial computed tomography including sinuses and orbits with contrast media | 2 | |
| Magnetic resonance: multiple views of paranasal sinuses with gadolinium | 2 | |
| Paranasal sinus sonography | 1 | A or B mode or real time. |
| Appropriateness Criteria Scale<br><br>1 2 3 4 5 6 7 8 9<br><br>1=Least appropriate 9=Most appropriate | | |

Variant 7: Suspected complication of sinusitis (e.g., orbital cellulitis).

| Radiologic Exam Procedure | Appropriateness Rating | Comments |
|---|---|---|
| Cranial computed tomography including sinuses and orbits with contrast media | 9 | |
| Coronal computed | 4 | Use intravenous contrast |

| | | |
|---|---|---|
| tomography scan of paranasal sinuses | | material. |
| Plain paranasal sinus radiographs | 2 | One to four projections. |
| Magnetic resonance: multiple views of paranasal sinuses with gadolinium | 2 | For problem solving. |
| Paranasal sinus sonography | 1 | A or B mode or real time. |
| Appropriateness Criteria Scale<br><br>1 2 3 4 5 6 7 8 9<br><br>1=Least appropriate 9=Most appropriate | | |

Variant 8: Complex sinus disease; rule out fungal sinusitis.

| Radiologic Exam Procedure | Appropriateness Rating | Comments |
|---|---|---|
| Cranial computed tomography including sinuses and orbits with contrast media | 9 | |
| Magnetic resonance: multiple views of paranasal sinuses with gadolinium | 9 | |
| Coronal computed tomography scan of paranasal sinus | 4 | Use intravenous contrast material. |
| Plain paranasal sinus radiographs | 2 | One to four projections. |
| Paranasal sinus sonography | 1 | A or B mode or real time. |
| Appropriateness Criteria Scale<br><br>1 2 3 4 5 6 7 8 9<br><br>1=Least appropriate 9=Most appropriate | | |

Summary

Coronal computed tomography (CT) scans are the gold standard for diagnosing soft tissue findings in the sinuses. However, the high incidence of soft tissue abnormalities in the sinuses of infants and children with intercurrent or recent upper respiratory tract infections necessitates the correlation of clinical and imaging findings. In addition, the incidence on computed tomography of anatomic sinus variations, Haller cells, concha bullosa, and so forth, along with the distribution of diseases within the sinuses is similar in asymptomatic infants and children, such as those with recurrent sinusitis.

Recommendations:

- The diagnosis of acute and chronic sinusitis should be made clinically, not on the basis of imaging findings alone.
- When acute sinusitis is diagnosed and appropriately treated, no imaging studies are indicated if full clinical resolution occurs.
- Patients with acute sinusitis persisting after 10 days of appropriate therapy, or with chronic sinusitis, and in whom imaging evaluation is desired, should undergo coronal computed tomography scans of the sinuses regardless of their age.
- The use of plain films in the evaluation of sinusitis should be discouraged unless exceptional circumstances warrant it. If plain radiographs are performed, only Waters and Caldwell views are recommended for patients younger than 4 years of age; for older patients, a lateral view is obtained. The lateral should be performed with cross-table technique if the Waters view cannot be obtained with the patient upright.

### CLINICAL ALGORITHM(S)

Algorithms were not developed from criteria guidelines.

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The recommendations are based on analysis of the current literature and expert panel consensus.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

Appropriate selection of radiologic exam procedures for diagnosis of sinusitis in the pediatric population.

### POTENTIAL HARMS

Not stated

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

An American College of Radiology (ACR) Committee on Appropriateness Criteria and its expert panels have developed criteria for determining appropriate imaging examinations for diagnosis and treatment of specified medical condition(s). These criteria are intended to guide radiologists, radiation oncologists and referring physicians in making decisions regarding radiologic imaging and treatment. Generally, the complexity and severity of a patient's clinical condition should dictate the selection of appropriate imaging procedures or treatments. Only those exams generally used for evaluation of the patient's condition are ranked. Other imaging studies necessary to evaluate other co-existent diseases or other medical consequences of this condition are not considered in this document. The availability of equipment or personnel may influence the selection of appropriate imaging procedures or treatments. Imaging techniques classified as investigational by the U.S. Food and Drug Administration (FDA) have not been considered in developing these criteria; however, study of new equipment and applications should be encouraged. The ultimate decision regarding the appropriateness of any specific radiologic examination or treatment must be made by the referring physician and radiologist in light of all the circumstances presented in an individual examination.

Two main controversies surround imaging of sinusitis in the pediatric population. The first is the use of plain radiographs versus coronal computed tomography scans. Although they are less costly and more widely available, plain radiographs both under- and overdiagnose sinus soft tissue change in the paranasal sinuses. The second and even greater controversial issue in imaging pediatric sinusitis is the high incidence of soft tissue findings on plain films, computed tomography, or magnetic resonance found in patients who have no clinical evidence of sinus disease or who undergo these examinations for other reasons. The incidence is reported to be 33%-50%. Soft tissue abnormalities on computed tomography scans are dynamic and can change from day to day. Clinical correlation is critical for accurate evaluation of these findings.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Getting Better

### IOM DOMAIN

Effectiveness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

McAlister WH, Parker BR, Kushner DC, Babcock DS, Cohen HL, Gelfand MJ, Hernandez RJ, Royal SA, Slovis TL, Smith WL, Strain JD, Strife JL, Kanda MB, Myer E, Decter RM, Moreland MS. Sinusitis in the pediatric population. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):811-18. [44 references]

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

1995 (revised 1999)

### GUIDELINE DEVELOPER(S)

American College of Radiology - Medical Specialty Society

### SOURCE(S) OF FUNDING

The American College of Radiology (ACR) provided the funding and the resources for these ACR Appropriateness Criteria™.

### GUIDELINE COMMITTEE

ACR Appropriateness Criteria™ Committee, Expert Panel on Pediatric Imaging

### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Panel Members: William H. McAlister, MD; Bruce R. Parker, MD; David C. Kushner, MD; Diane S. Babcock, MD; Harris L. Cohen, MD; Michael J. Gelfand, MD; Ramiro J. Hernandez, MD; Stuart A. Royal, MS, MD; Thomas L. Slovis, MD; Wilbur L. Smith, MD; John D. Strain, MD; Janet L. Strife, MD; Mireille B. Kanda, MD; Edwin Myer, MD; Ross M. Decter, MD; Morey S. Moreland, MD

### FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

### GUIDELINE STATUS

This is the current release of the guideline. It is a revision of a previously issued version (ACR Appropriateness Criteria™ for sinusitis in the pediatric population. Reston [VA]: American College of Radiology (ACR); 1995. 8 p.).

The ACR Appropriateness Criteria™ are reviewed after five years, if not sooner, depending upon introduction of new and highly significant scientific evidence. The next review date for this topic is 2004.

## GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American College of Radiology (ACR) Web site.

Print copies: Available from ACR, 1891 Preston White Drive, Reston, VA 20191. Telephone: (703) 648-8900.

## AVAILABILITY OF COMPANION DOCUMENTS

None available

## PATIENT RESOURCES

None available

## NGC STATUS

This summary was completed by ECRI on March 25, 1999. The information was verified by the guideline developer on September 9, 1999. The summary was updated on February 12, 2002. The information was verified again by the guideline developer on March 25, 2002.

## COPYRIGHT STATEMENT



Date Modified: 11/8/2004


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